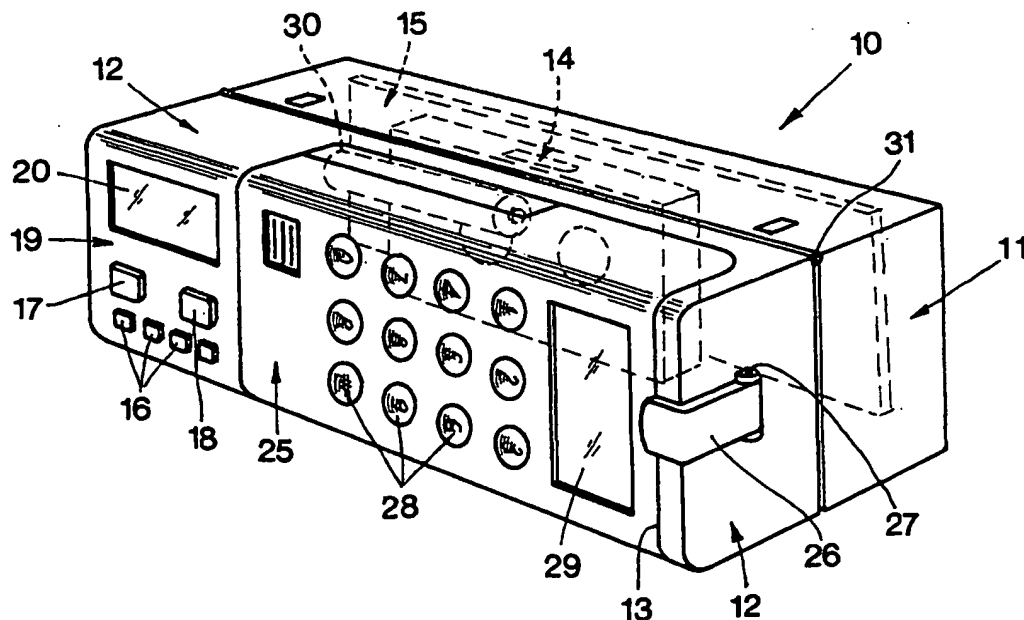




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(54) Title: PORTABLE MULTI-PURPOSE AUDIO COMPLEX FOR MOTOR VEHICLES



(57) Abstract

Portable electronic complex (10) for motor vehicles, comprising a rear section (11) with electronic circuits (15) for support, formation and amplification of devices for sound reproduction and recording (14), for a radio and for a cordless phone (25), a front (19) with devices for control (16) and regulation, for changing from one function to another, for regulating volume (17), frequencies (18), tuning, with headset or by direct voice and comprising a group for connection to the battery, to the diffusers (35) and to the antenna (60) of the motor vehicle, so that the radio, phone calls, reproduction and registration of sound can all be used at the preferred volume and in the desired manner.

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Portable multi-purpose audio complex for motor vehicles

The invention concerns audio-telephone electronic devices.

Diffusion of audio accessories that permit reception of radio broadcasts,
15 recording and reproduction of sound and words as well as communication by telephone when far from home and travelling in a motor vehicle is becoming increasingly widespread.

Though space for such accessories is limited in a motor vehicle, especially if designed to take an ordinary car radio set, there are however some
20 useful means available for electronic equipment such as an electric battery, sound diffusers and an antenna to pick up radio waves.

Some circuits for electronic accessories such as a cordless phone, radio set, cassette and compact disc readers are substantially similar and multi-purpose, especially in their electric feed, sound amplifying and re-
25 gulating circuits.

Purpose of the above invention is to realize a compact accessory whose bulk can fit into the spaces available in motor vehicles for radio sets, substantially able to replace all the equivalent electronic circuits with a multi-purpose circuit that can be used by the different devices included in
30 this accessory to the great advantage and convenience of the user as will be explained below.

Subject of the invention is a portable electronic complex for motor vehicles comprising:

- an amplifying and supporting body for equipment that reproduces and records sound, for a radio and for a cordless phone;
- a front face with operating and regulating controls, for changing from one function to another, for adjusting volume, frequencies, tuning, for
5 using a headset or for receiving a voice direct;
- a set of connections to the battery, to the diffusers and to the vehicle's antenna so that the user can listen to the radio, take a phone call, reproduce and record audio, regulate volume as preferred.

Dimensions of this complex conform to EU standards for car radios so
10 that it can fit into the spaces provided for them in motor vehicles.

The complex is a parallelepiped; it comprises a forward and a rear part of substantially the same height, length and width, joined by a hinge.

In the rear part are the main electronic circuits for amplification and connection to the diffusers, antenna and battery in the motor vehicle, for
15 reproduction and recording, and for the radio, the forward part comprising the front surface with its controls and recess for the cordless phone.

The cordless phone is compact, of a substantially parallelepiped form, its length being slightly less than that of the whole complex but being of the same height when lying flat.

20 Using the controls on the front, one or other of the devices can be brought into use, audio volume adjusted, radio tuning and frequency, ear-phones or amplifier for the telephone.

The telephone circuit preferably comprises keyed access,

In one preferred execution the front body can be turned on its hinge in relation to the rear body so giving access to reproduction/recording devices
25 in said rear body.

The whole apparatus comprises the following main groups some of which are usually present in motor vehicles:

- group comprising the main circuits for amplification, for feed, for the
30 radio, for cassette reproduction/recording, for the compact disc reader;
- group comprising the telephone receiver, telephone transmitter and the battery removable from said telephone;

- group comprising the antenna switch circuit, an electronic switching circuit, a recharging circuit,
the amplifier being connected to the motor vehicle's diffusers, feed being connected to the car battery, the antenna switch being connected to the car's antenna, to the radio, to the transmitter and telephone receiver, the electronic switch being connected to the amplifier, to the radio receiver, to the compact disc reader, to the cassette reproducer, to the telephone receiver. the re-charger being connected to the removable battery and to the feeder.
- 10 A microcircuit that handles telephone calls, through an antenna control circuit, selects radio antenna input of an AM/FM tuner circuit for operating the system as a radio, and also selects audio output from the main microprocessor for listening to the emitter selected through the motor vehicle's diffusers.
- 15 In the cordless phone mode, or during a call, the microcircuit selects the phone's antenna input/output through the antenna control circuit, and selects telephone audio output through a mute audio circuit for hearing a communication on the diffusers.
- At the end of the phone call operation is automatically returned to the radio by the microcircuit.
- 20 The invention offers evident advantages.
- Using a motor vehicle's battery, antenna and diffusers and an amplifying circuit, practically all the most widely used devices in ordinary life can be realized and operated.
- 25 Radio programmes in particular can be received on different frequencies, recorded and reproduced on tapes and compact discs, and phone calls be made and received with and without earphones.
- The user can therefore benefit not only from all the means available for continuous communication with the outside world, but can also enjoy
- 30 broadcasts and recorded sound while travelling or with the vehicle parked in any place, obtaining maximum performance at minimum cost.

The entire electronic unit can be comprised in a plastic or metal container of dimensions substantially equivalent to those of any well-known car radio, respecting EU standards.

Characteristics and purposes of the invention will be made still clearer by
5 the following example of its execution, illustrated by diagrammatically drawn figures.

Fig. 1 Electronic complex subject of the invention, for installing in any ordinary motor vehicle, perspective.

Fig. 2 Diagram of the electronic network.

10 Fig. 3 Flow diagram.

The complex 10 of a substantially parallelepiped shape consists of a forward section 11 and a rear 12 section each of similar length and height and each half the total width.

The rear section 11 comprises basic electronic circuits, especially for
15 amplification, common to the various devices, generally indicated by 15, and the sound recording and reproduction devices by cassette and compact disc generically indicated by 14.

The forward section 12 comprises a front 19 carrying controls 16 for operating the various devices, and controls 17 and 18 for radio volume,
20 tuning and frequencies and comprises a display 20 to show radio frequencies and everything useful for operating sound reproduction, and comprises the recess 13 to take a cordless phone 25.

The cordless phone 25 is held firmly in place by the hook 26 that turns on a hinge 27 and comprises buttons 28 to make the call, a display 29 for
25 visualizing and checking calls and the battery 30 automatically recharged, through connections in the base section 11, from the vehicle's battery.

By turning the forward section 12 back on the hinge 31 access is given to the front face of the rear section 11.

It will be clearly seen that having stabilized the base section 11 in a suitable space in the motor vehicle and having electrically connected said
30 section to the motor vehicle's battery, using the controls 16 the following functions are possible.

Listening to the radio 45.

Normal use of the cordless phone 25 either taking it out of its seat 13 or leaving it there.

Recording and reproduction of sounds with cassettes or compact discs, gaining access to the front of the rear section 11 by turning back the
5 forward section 12 on its hinge 31.

The electronic circuit automatically turns off the radio or the reproducer of sound as soon as the user receives a phone call.

The various controls make possible amplification of telephone audio using the amplification system of the whole accessory described and the
10 motor vehicle's diffusers, and adjustment of volume and the sources of diffusion so as to obtain listening conditions suited to the circumstances.

The described electronic complex can also be connected to the motor vehicle's own antenna 60.

The above description is further illustrated by the diagram of the elec-
15 tronic network in Fig. 2.

The microcomputer 39 controls all parts of the network.

The circuit that connects the motor vehicle's diffusers 35 to the amplifier circuit comprises the amplifier 36 and preamplifier 37 circuits.

the mute audio circuit 38 selects sound sources to send on to the
20 amplifier circuits 36, 37.

When a call is reaching the cordless phone 25, the signal from the radio receiver circuit 45 is automatically turned off and that from the microprocessor 40, controlling the phone 25, is turned on.

The AM/FM tuner circuit 45 receives the signal from the antenna control
25 HF circuit 46 and tunes into the various radio emitters at different frequencies.

The Tape circuit 47 reads the audio signal memorized on the cassette's magnetic tape.

The CD circuit 48 reads the audio signal digitally memorized on the CD
30 ROM.

The control keyboard 49 allows the user to choose from the different sources and to adjust audio parameters to all the other components of the system.

The display 20 shows radio receiver settings and frequencies.

The stabilizer 55 adapts and filters motor vehicle voltage to suit it to all electronic parts in the whole system.

5 The cordless phone 25 has its own auxiliary input-output antenna 58 and is connected by its connector 59 to the microprocessor 40 for handling the call.

When normally functioning this microprocessor 40 selects, through the antenna control circuit 46, antenna radio input to the AM/FM tuner circuit 45 and also selects audio output from the microprocessor 39 for listening
10 to the chosen emitter through the motor vehicle's diffusers 35.

When in the cordless phone mode, during a call the microprocessor 40 selects the phone's antenna input/output through the HF antenna control circuit 46 and selects the phone's audio output through the mute audio circuit 38 for hearing a phone call on the diffusers 35.

15 At the end of the call the circuit takes the user back to radio mode.

The antenna HF control circuit 46 selects input of the radio tuner 45 or input/output of the phone 25 for using the motor vehicle's external antenna 60.

20 The charge circuit 65 permits the battery 30 of the cordless phone 25 to be recharged by the vehicle's electric feed indicated by 56.

Claims

1. Portable electronic complex (10) for motor vehicles,
characterized in that it comprises a rear body (11) with basic electronic
circuits (15) for support, formation, amplification (35) and feed (56) of
5 sound reproduction and recording components (14, 47, 48), for a radio
(45) and a cordless phone (25), a front (19) with control and regulation
devices (16-18) for changing from one function to another, for adjustment
of volume, of frequencies, of tuning, from use of earphones to direct
voice and comprises a group for connection to the battery (30) of the
10 cordless phone, to the diffusers (35) and to the antenna (60) of the
motor vehicle, to permit the user to listen to the radio, or use the tele-
phone, or to make audio recording or reproduction at the desired volume
and as preferred.
2. Portable electronic complex (10) for motor vehicles as in claim 1,
15 characterized in that its bulk complies with European standards for car
radios enabling it to be fitted into the standardized recesses made in
motor vehicles for such radios.
3. Portable electronic complex (10) for motor vehicles as in claim 1,
characterized in that it is parallelepiped in shape and comprises two sec-
20 tions placed side by side, a rear one (11) and a forward one (12) of sub-
stantially equal volume, height, length and width joined by a hinge (31),
the rear section comprising the main electronic circuits (15) for amplifica-
tion and connection to the diffusers (35), the antenna (60), the battery
(56) of the motor vehicle, the devices for reproduction and recording (14)
25 and the radio, the forward part (12) comprising the front (19) for controls
(16, 17, 18) and the recess (13) for the cordless phone (25).
4. Portable electronic complex (10) for motor vehicles as in claim 1,
characterized in that the cordless phone (25) is of a compact substantial-
ly parallelepiped form, its length being slightly less than that of the
30 complex and its height being equal.
5. Portable electronic complex (10) for motor vehicles as in claim 1,
characterized in that by using the controls (16, 17, 18) situated on the
front (19), one or another of the devices can be operated controlling

audio volume, radio tuning and frequencies, using the telephone (25) with or without a headset.

6. Portable electronic complex (10) for motor vehicles as in claim 1, characterized in that the circuit (40) of the cordless phone (25) comprises
5 electronic keyed access.

7. Portable electronic complex (10) for motor vehicles as in claim 1, characterized in that the forward section (12) can be turned on its hinge in relation to the rear section (11) to permit access to the devices for listening, reproduction/recording (14) of sound, inserted in said rear section
10 (11).

8. Portable electronic complex (10) for motor vehicles as in claim 1, characterized in that it is electronically constituted of the following main groups, some of which are normally present in motor vehicles:

- a group comprising the main electronic circuits (15) for amplification
15 (36), feed (56), radio (45), cassette reproduction/recording (47), compact disc reader (48),

- a group comprising the receiver, transmitter and the removable battery (30) of the cordless phone (25),

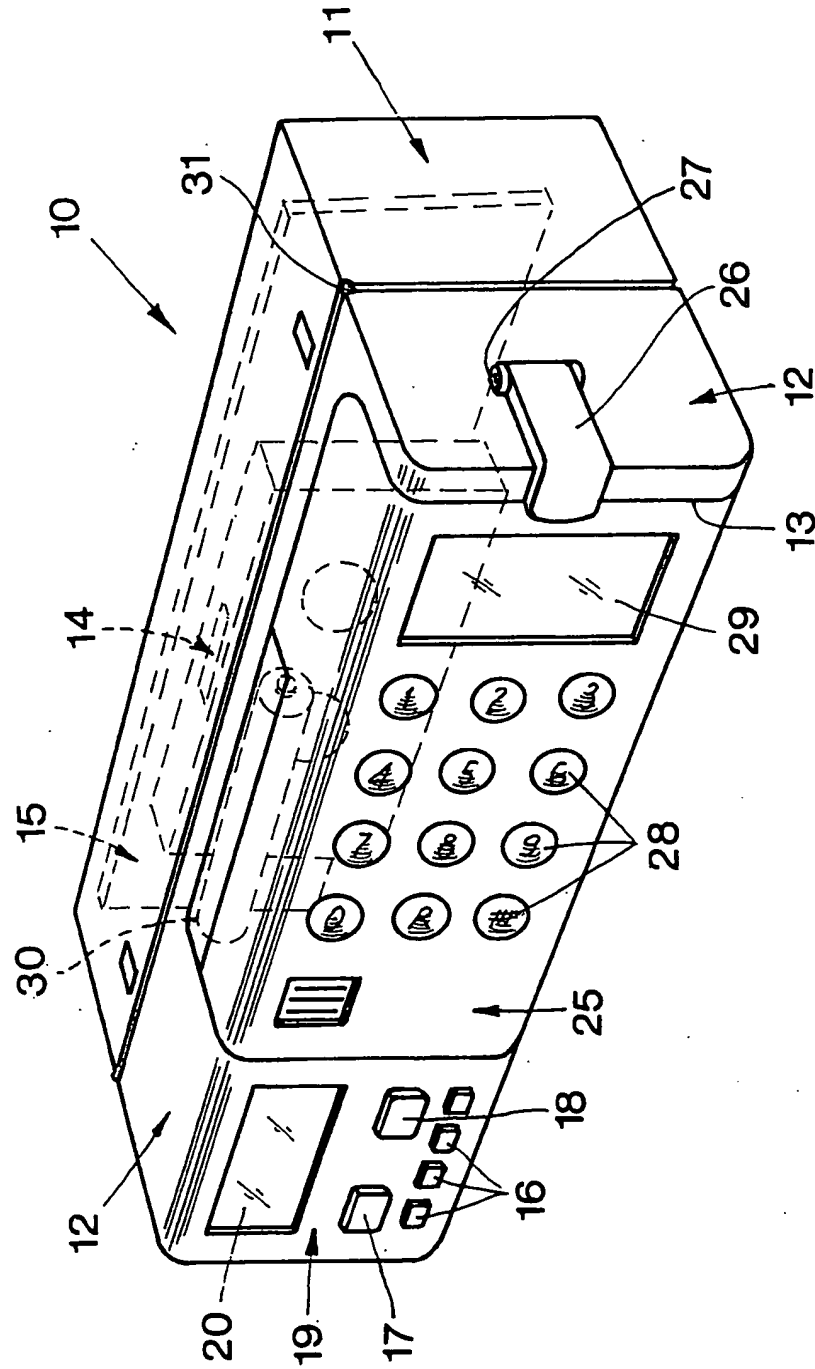
- a group comprising an antenna switching circuit (46), an electronic
20 switching circuit (40), a recharging circuit (65),

the amplifier (36) being connected to the vehicle's diffusers (35), the feeder (56) being connected to the car battery, the antenna switch (46) being connected to the car antenna (60), to the radio receiver-transmitter (45) and to the cordless phone (25), the electronic switch (40) being connected to the amplifier (36), to the radio receiver (45), to the compact disc
25 reader (48), to the cassette reproducer (47), to the telephone (25), the recharger (56) being connected to the removable battery (30) and to the feeder (56).

9. Portable electronic complex (10) for motor vehicles as in claim 1,
30 characterized in that a microcircuit (40) that handles the telephone call through an antenna control circuit (46) selects input of the radio antenna of an AM/FM tuner circuit (45) for operating the system in the radio mode and also selects the audio output from the main microprocessor (39) for

listening to the selected emitter through the vehicle's diffusers (35), but when, in the cordless phone mode, especially during a call, selects antenna input/output (58) of the cordless phone (25) through the antenna control circuit (60) and selects the audio output of the telephone through
5 a mute audio circuit (38) for listening to the call on the diffusers (35), while, at the end of the phone call, automatically returning the system to radio mode..

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Fig. 1

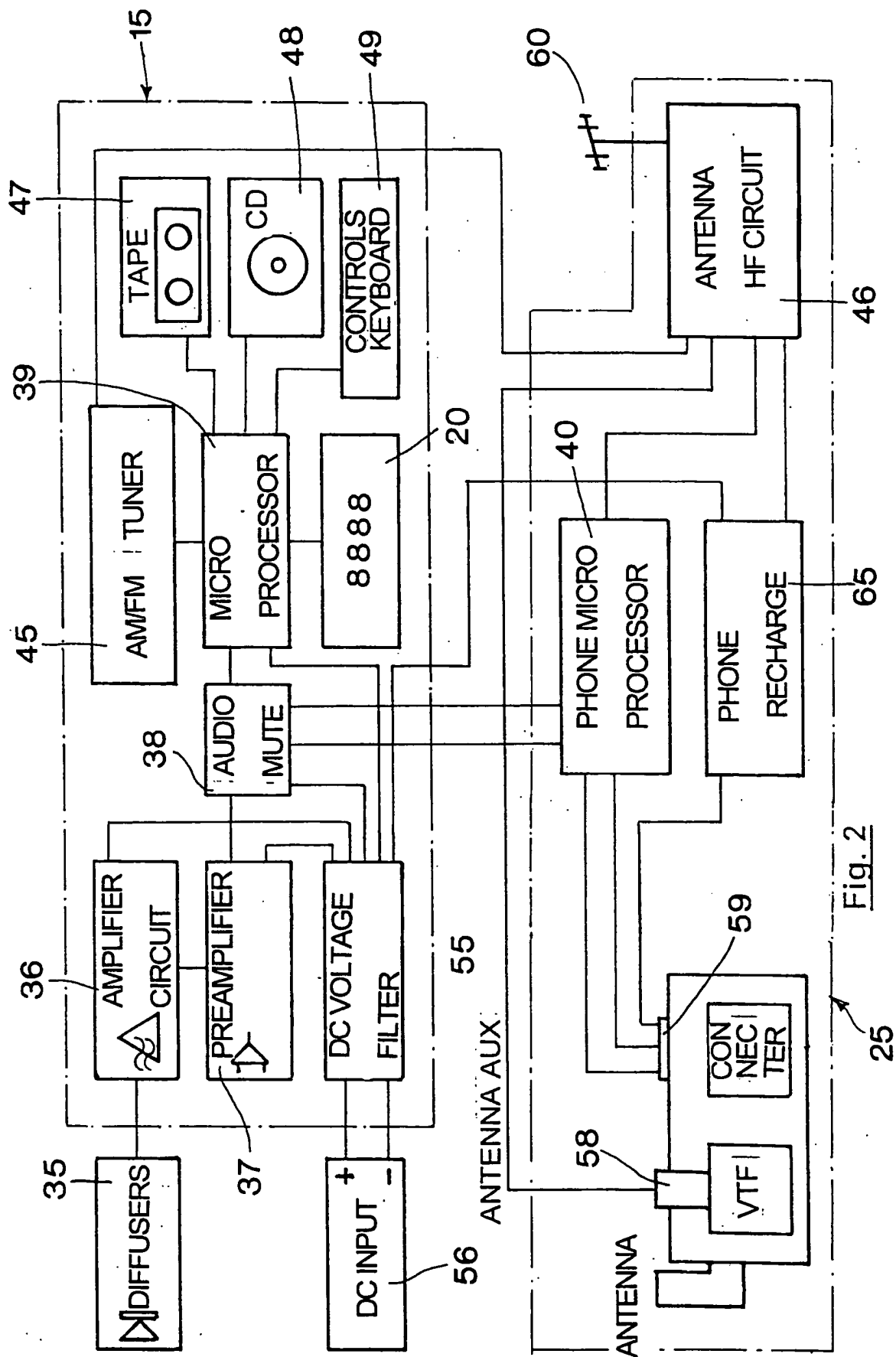


Fig. 2

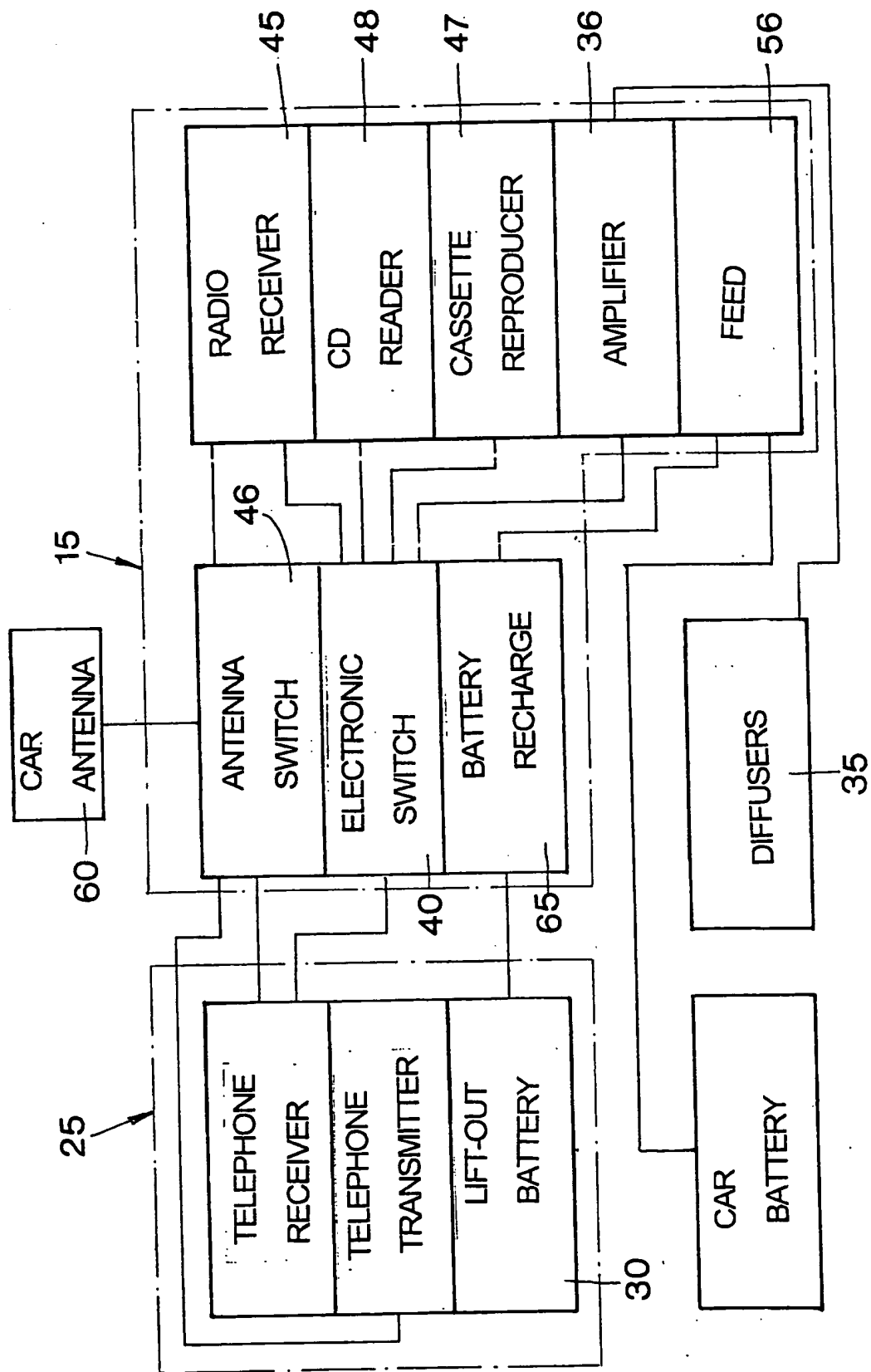


Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 97/00302

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04B1/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04B B60R H04M H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 537 673 A (NAGASHIMA AKIRA ET AL) 16 July 1996	1,2,4-6
A	see column 2, line 17 - line 35; figures 1,2	3,7-9
A	DE 296 05 543 U (BOESE WINFRIED) 5 June 1996 see the whole document	1-3,5,6
X	GB 2 264 613 A (PIONEER ELECTRONIC CORP) 1 September 1993	1,2,6
A	see abstract; figure 1	3-5,7-9

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IT 97/00302

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